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A
TREATISE
ON
THE CULTURE OF WHEAT.

BY
WILLIAM DALRYMPLE, ESQ. ✓

DEDICATED
TO
HIS ROYAL HIGHNESS
THE
DUKE OF CLARENCE.

"And he gave it for his opinion, that whoever could make two ears of
"corn, or two blades of grass, to grow upon a spot of ground where
"only one grew before, would deserve better of mankind, than the
"whole race of politicians put together." SWIFT. *Gulliver's Travels*.

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WILLIAM DRYDEN, ESQ.

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LONDON:

Printed by W. BARNARD and CO.
STATIONERS, in the Strand, near St. James's Church.

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 with the utmost deference to submit
 the few following sheets, on the
TO
 Culture of Wheat, to your Royal
HIS ROYAL HIGHNESS
 Highness's consideration. Although
 there is little new in the work, yet
THE
 having concentrated the practice of
DUKE OF CLARENCE
 opinions on the subject, I thought
 it might prove beneficial to farmers
 in general.

SIR,

THE improvement which your
 Royal Highness has already made in
 Bushy Park, by adopting and con-
 necting different modes of Tillage;
 and the disposition of your Royal
 Highness to promote the progress

of Agriculture, has induced me, with the utmost deference, to submit the few following sheets, on the Culture of Wheat, to your Royal Highness's consideration. Although there is little new in the work, yet having concentrated the practice of different systems, and a variety of opinions on the subject, I thought it might prove beneficial to farmers in general.

If, amidst the numerous Volumes on Agriculture now in circulation, this effort to advance a science of so much importance to mankind should be sanctioned by your Royal

Highness's approbation, it will give
me the most entire satisfaction.

With the greatest respect,

your Royal Highness's

most devoted Servant,

WILLIAM DALRYMPLE.

Cheshington,

June 4th,

1800.

PREFACE.

AGRICULTURE, as Marechal Saxe says of war, is a science to the learned. To obtain a perfect knowledge of it, requires a more enlarged mind than is usually found amongst the generality of farmers. To the superior talents and liberality of the Gentleman farmer, we are indebted for some of the most ingenious Theories, and a variety of useful Practice. But still there is a great deal more to be done; for it is astonishing to see so much bad husbandry even in the vicinity of the capital. The power of custom is so absolute, it is exceedingly difficult to counteract it; and therefore much time, activity, and perseverance, are requisite to advance any art to its utmost degree of perfection. The professional farmer is frequently so much cramped for want of money to work his land to advantage, that he is

obliged to rack his ground in order to defray the ordinary expences of his farm, and to obtain the means of subsistence; and we rarely meet with men of this description, who will venture to change, or vary their ordinary course of husbandry. Their local situation confines their ideas to the soil they have been accustomed to use; and, following the steps of their forefathers, they cannot risk experiment, and seldom make an effort towards improvement.

This little work is arranged according to the practice to which I have been accustomed on Strong land; and that which I have seen so effectual on Light land. But the Culture of Wheat is a subject of such extent, that it were impossible, with the brevity I have used, to render the discussion of it complete.

I have endeavoured to correct a mistake, which some of our Agricultural reporters have made, by attempting to establish general

principles to a subject of such various quality as land is. I have urged the necessity of applying distinct systems to different soils, as a most essential point, towards the diminution of labour and expense, and the increase of produce. And as I have no other view from this publication than of being useful to society, I shall offer no apology for intruding myself upon the public, but submit the merits of the production to the candour of my readers.

✂ There are some quotations marked in the following pages, which were made in the course of reading, without any view of publication; but as I did not set down the authors from whence they were taken at the time I made them, I have forgot the authority.

ERRATA.

- Page 8. Note, *for Hume, read Home.*
 — 12. line 19, *for sowed, read sown.*
 — 37. — 10, *for sowed, read sown.*
 — 45. — 7, *for divided, read distributed.*

ON THE

CULTURE OF WHEAT.

IN a very ingenious little work, "The
"Outlines of Agriculture," published by Dr.
Hunter of York, in 1795, are the following
particulars concerning the growth of wheat.

"Wheat has two sets of roots. The first
"comes immediately from the grain; the
"other shoots from the crown some time
"after. I shall distinguish them by seminal
"and coronal roots.

"The first, or seminal root, is pushed
"out at the same time with the germ,
"which, together with the farina, nourishes
"the plant during the winter, before the
"crown and coronal roots are formed.

“ At this season, the grain is filled with
 “ a milky juice for the support of the plant,
 “ during what may be called its infant state.

“ In the spring, when the crown has be-
 “ come sufficiently large, it detaches a
 “ number of strong fibres, which push them-
 “ selves obliquely downwards. These are
 “ the coronal roots, serving to nourish the
 “ plant till it arrives at maturity. A small
 “ pipe preserves the communication between
 “ them and the seminal roots. This makes
 “ an essential part of the plant; and is ob-
 “ served to be longer or shorter, according
 “ to the depth that the seed has been buried.
 “ It is remarkable, however, that the crown
 “ is always formed just within the surface.
 “ Its place is the same, whether the grain
 “ has been sown deep or superficial. As the
 “ increase of wheat depends upon the vigo-
 “ rous absorption of the coronal roots, it is
 “ no wonder that they should fix themselves
 “ so near the surface, where the soil is
 “ always the richest.

“Wheat sown superficially, must be
 “exposed to the severity of the frost, from
 “the shortness of the pipe of communica-
 “tion. The plant, in that situation, has
 “little benefit from its seminal root. On
 “the contrary, when the grain has been
 “properly covered, the seminal and coronal
 “roots are kept at a reasonable distance.
 “The crown being well nourished, by
 “means of the seminal root during the
 “winter, sends up numerous stalks in the
 “spring; and on the tillering of the corn
 “the goodness of the crop principally de-
 “pends.”

From these very curious and anatomical facts, we are led to consider

THE PREPARATION OF LAND FOR WHEAT.

The wheat crop being the most material,
 both for the farmer and the public, it is essen-
 tially necessary that the ground should be
 in good heart, and in the cleanest possible

state, to receive the seed. This is to be accomplished conformably to the nature of the soil;

1st. By Summer fallowing.

It is affirmed by some of the most respectable authorities, that "Summer fallows are exploded." Mr. Kent, in his Norfolk Survey, says, "That the Turnip crop is the fallow, and certainly brings land into a cleaner state than any other mode of cultivation." Mr. Middleton also observes, in his View of the Agriculture of Middlesex, "That smothering crops, such as Tares, Pease, Beans, Clover, &c. should be substituted in lieu of a fallow." These opinions having been zealously circulated, and frequently admitted, are apt to mislead the unwary. But the system of Summer fallowing, so long established, upon the principle of restoring exhausted land to fertility, cannot be at once abandoned, without stronger reasons than have been hitherto adduced against it. For, taking the science of agriculture upon the

most enlarged scale, such assertions rather tend to check than promote its progress. And the cultivation of Strong land, under certain circumstances, cannot be pursued upon the systems of the above-mentioned gentlemen. I therefore agree with Mr. Howlet, in part of his remark on Mr. Kent, that "Fallowing must depend upon the nature of the soil, and the quantity of manure that can be raised." And I shall also add, upon the local situation of the farm, which may enable the farmer, at an easy expence, to procure manure beyond the quantity which he can make upon the premises.

Without entering into a minute description of every kind of land, I shall here observe, that soils, like the shades of colours, are so blended with each other, that it would be rather difficult to class them, in such a manner as to be clearly understood by any reasoning, separately, upon the great variety that exists. Therefore, taking the strongest

and the lightest as the criterion, (which is sufficient for my present purpose) whenever I mention Strong Land, I mean very Strong loam, bordering on clay (Clayey loam); and Light Land, that kind of soil which approaches to sand. All intermediate soils partake, in a certain degree, of these extremes; and similar arguments will hold good for Strong or Light lands, in proportion as each soil recedes from the strongest towards the lightest; and from the lightest towards the strongest; and they must be worked accordingly.

Light lands, by frequent ploughings and harrowings, may be cleaned without injury to the soil, at almost any time, except during rain, frost, or snow. The usual mode is, to break them up in autumn, and by spring ploughings and harrowings, prepare them for turnips, &c. in June and July; which, together with the subsequent hoeings, and feeding them off with sheep, clean and enrich the soil. But when, and

in what manner, must strong land be cleaned?

Strong land may be worked whilst wet, till it becomes as hard as flint when dry. If broke up in the autumn, winter fallowing will not destroy couch grass and other noxious weeds. For when the ground is once thoroughly wet, there is an end of every effort to clean it; and it is generally in that state, in this country, from October till towards May. There may, however, be partial moments in that space of time, when the ground might be worked; but they are not of sufficient duration for the farmer to risk his labour to so little purpose.

“ Let not the plough be applied to clay
 “ till the air has performed its part, by
 “ drawing off every particle of water that is
 “ not in contact with it. Nick that minute
 “ for applying the plough: the clay, still
 “ soft, is easily divided: a new surface is

“ laid open to the air; and at the same time
 “ is preserved free and open.

“ To plough clay wet, kneads the parts
 “ together: on the other hand, the ground
 “ must not be suffered to turn hard: be-
 “ tween soft and hard is the proper condi-
 “ tion for ploughing.”*

Turnips may be raised on strong land. If activity be used when the weather suits, an opportunity may be found to render the soil sufficiently friable to obtain a season. But having raised them, there is great difficulty to feed them off. If the spring be wet, the cattle and sheep must be removed, or they will poach the ground in such a manner, as to render it unfit for the ensuing season. At any rate, it must, in general, be too late for oats, and barley is not suited to such a soil.

• Hume's Gentleman Farmer.

Turnips may be drawn during the winter, for cattle or sheep to be fed with them in hovels, the yard, or on leys; and this method is practised both on strong and light land in many parts of the kingdom; but there is not only a considerable expence attending this work, especially if the turnip field be at a distance from the home-stall; but strong land is so trodden and cut up by the horses and carts, and the ground is so chilled by the wet lodging in it, that the spirit of the dung, which was laid on for the turnips, is not only exhausted by it, but the succeeding crop is likely to be deficient: and to make oats the first crop of a course, with these disadvantages, is not the best husbandry. In short, the Turnip system is not calculated for stiff soils. And I am humbly of opinion, that the course of crops for strong land, which obtained the medal in 1794-5,

Viz. Tares, I summer fallow

Oats, on the 20th of September sowed two rows

Clover, with five and on the 10th of October six rows

Wheat, On the 1st of February sowed one row

is not so favourable on this sort of land, according to the circumstances stated in the Transactions of the Society, as if it were reversed :

Tares,

Wheat,

Clover or beans,

Oats.

It were better to manure after the Oats, than after the Wheat for the Tares : the manure, in this case, will be nearer the wheat ; and tares flourish more after oats than wheat. By following this mode of cropping, the ground is cleaner, and kept in better heart for wheat, and not so subject to the slug as under the former course.

I have a field of eight acres, which, having been much exhausted by repeated white crops, I summer fallowed ; and, without manure, on the 29th of September, I sowed two acres with rye, and, on the 5th of October, six acres with tares. On the 1st of May following, I cut

the rye green for my cattle; and as fast as the ground was cleared, I ploughed the two acres and sowed them with summer tares; which, with the rye, and winter tares, fed eight horses for twenty-one weeks, without any other food. As the tares were taken off, I ploughed the field, afterwards hunted it, then harrowed it; and ploughing it once more, without manure, I sowed it with Wheat, and in the ensuing spring with Clover. I had twenty-six bushels of wheat per acre, with so much bulk of straw that great part of the field was laid. The succeeding year, the clover was thin for want of dressing. I must observe, that the wheat was not so strong in ear where the rye had grown, as in the other part of the field.

I have another field of two acres, which, like the former, is not of very strong land. This little field was summer fallowed and manured for wheat. It had wheat again the second year. After the crop was off the ground, I ploughed it; and in the ensuing

spring ploughed it twice more, and sowed it with Pease. It produced three quarters per acre, with a great bulk of haum. As soon as the pease were off, I dressed it with about eight loads of manure per acre, ploughed it once, and sowed it with Turnips, which I drew in part, and fed the remainder. The ground was trodden so hard by the sheep in the spring, that I had infinite labour to obtain a season; but on the 1st of May I sowed it with Barley, Clover, and Bents. I had six quarters one bushel of barley per acre; and the following year had six loads of clover, of the first and second cut. The ensuing winter, I drew Turnips from an adjoining field, and fed sheep upon the ley. In the spring I ploughed it, and sowed it with Tartarian oats; it produced nearly seven quarters per acre. After the oats, it was sowed with Tares. When the tares were cut for my horses, I gave it a bastard fallow; and dressing it with about ten loads of manure per acre, sowed it with Wheat; which has now produced 135 shocks reaped. Thus this field was

Fallow,
 Wheat,
 Wheat,
 Pease, followed by turnips,
 Barley,
 Clover and bents,
 Oats,
 Tares, then bastard fallow,
 Wheat.

These two acres have afforded me strong arguments, with the neighbouring farmers, against Summer fallowing. Yet, notwithstanding this circumstance, I find it impracticable to proceed in the same manner with my much Stronger land, and have lost considerably by the attempt. This field being close to the home stall, was more handy to manure; and the size of it was favourable to experiment.

A farmer, who lives near me, went upon the same plan as I did, of not summer fallowing upon strong land. He kept his teams constantly employed in bringing manure; but, at length, he laid on so much,

that he could obtain a crop of little else but weeds; and is now, as well as myself, obliged to have recourse to summer fallowing.

I had a field of milchy land, which had been very much exhausted, and had been cropped twice in succession with oats. I summer fallowed it, and laid it up, well water furrowed, all the winter. On the 31st of March, I ploughed it once, and without manure, sowed it with Oats. I had above six quarters per acre. A neighbouring farmer worked one of his fields in the same manner, and he had above ten quarters per acre. If we had sown our fields the preceding spring with Oats, without the Summer fallow, or Manure, we should have obtained little more than the seed in return, and a most abundant crop of weeds.

A Norfolk farmer took a farm on our Strong land. He established a flock of sheep; and with the ploughs and implements of his own country, began his system of Norfolk

husbandry: he ruined fine turnips, but could not feed them off in time to sow that kind of grain which was most suitable to the soil. He could not plough his fields with the Norfolk plough till the ground was dry, and thereby lost his seasons. At length, finding himself in an error, he was obliged to have recourse to the swing plough, to give up his working flock of sheep, and follow the custom of the country; but not till he had sustained considerable loss by his experiments.

If it should be said, suppose the summer proves wet, what becomes of your summer fallow? The only answer to this query is, that a wet summer is always an unfavourable circumstance to the farmer on Strong land; yet the summer must be exceedingly wet, if opportunities cannot be found to work the ground sufficiently to destroy the vegetation of weeds.

Tull's hoeing system of husbandry is, in fact, summer fallowing between the drills of

corn, to destroy the vegetation of weeds, and to pulverize the earth.

When manure cannot be obtained, the soil is meliorated, by being agitated so frequently with the plough and harrow; and, without a reference to any supposed acquisition from the sun and air, vegetation of weeds is constantly checked; finer particles of earth are brought into action; and the land is cleaner and more perfect for the ensuing crop, which will, to a certainty, be more equal after a complete summer fallow.*

* In Bushy Park, the earth had been only scratched upon the surface for a series of years. But since his Royal Highness the Duke of Clarence has had possession of it, by the frequent and deep ploughings given to the arable land, fresh mould had been intermixed with that which had been exhausted; and this circumstance, with other causes combined, has contributed to the abundant crops that have been produced. Where the ground was in condition, the last year's produce of wheat, although a season so generally unfavourable, has exceeded a load per acre, with above five load of straw. And from a field of five acres and a half sown with Tartarian oats, after Turnips fed off early, sixty-three quarters have been thrashed out.

Mr. Kirwan, in his treatise on Manures, says, "the use of fallowing seems to me, to consist in exposing the roots of vegetables to decay, whereby food for a fresh growth is prepared; the atmosphere also deposits fixed air and carbonaceous substance on earth long exposed to it." Mr. Evelyn, quoting Sir Hugh Platt, observes, "that if you take a certain quantity of even the most barren earth you can find, reduce it to a fine powder, and expose it for a year to the vicissitudes and changes of the seasons, and influences of the heavens, it will acquire such a genuine and masculine pregnancy, as to cause all vegetables to prosper in the most exalted degree."

On His Majesty's Flemish farm at Windsor, Cabbages have been introduced as a cleaning crop. But the land must be highly manured for them; and His Majesty has an opportunity of turning his cattle into a considerable extent of grass during the summer and autumn, and of fattening them in the

winter with those Cabbages, and a great deal of coarse hay. To the farmer, on Strong land, not possessed of such a situation, an equal disadvantage would arise from feeding off Cabbages as Turnips, exclusive of their being an exhausting crop.

Some farmers in my neighbourhood do not raise more than from fourteen to eighteen bushels of wheat per acre, because manure is so distant and expensive; and if they did not Summer fallow, they would have very short crops. At the same time, I think they do not sufficiently mix their cultivation with meliorating crops. For “vegetables that
 “ have a succulent leaf, such as vetches,
 “ pease, beans, and buck-wheat, draw a
 “ great part of their nourishment from the
 “ air, and on that account impoverish the soil
 “ less than wheat, oats, barley, or rye; the
 “ leaves of which, although succulent for a
 “ time, during which period the plants draw
 “ little from the earth, yet, as soon as the
 “ ear begins to be formed, lose their soft-

“ness, and diminish in their attractive
“power.” But local circumstances must
have great influence on the mode of crop-
ping, with respect to the interest both of
the landlord and the farmer. In Northamp-
tonshire and the adjacent counties, the
system on the common field is,

Fallow,

Wheat,

Beans, and then

Fallow.

I should think a crop of Oats might be
taken after the Beans, before the land were
fallowed again. But still this matter requires
serious consideration; for it is possible, that
by taking such an exhausting crop as Oats
in rotation, the succeeding crops of Wheat
and Beans might be diminished by it; and
the farmer, in a course of years, might lose
more by this additional crop, than he could
gain by any advantage that would imme-
diately result to him from a change of

system; although a great produce is frequently obtained from cross-cropping.

His Grace the Duke of Grafton has cropped a field of moderate land, rather of a stiffish nature, alternately with wheat and beans for eight years; but it was regularly manured every third year.* This mode of cropping is in conformity with the local system of Wheat and Beans; but, probably, under other circumstances, the same system might not have been pursued; and particularly, if manure could not have been obtained every third year, the land must have been exhausted by it.

“ Among many advantages of fallowing,
 “ the exposing to the air a new surface
 “ from time to time, is one; by that means,
 “ every part of the soil draws air with the
 “ vegetable food it contains. Columella,
 “ book ii. chap. iv. advises ground to be
 “ reduced to dust by ploughing. And he

* Annals of Agriculture, No. 190.

“ quotes a saying of the ancient Romans,
 “ that that land is ill ploughed, which wants
 “ harrowing after the seed is sown.”*

From these considerations, founded upon
 experience, and from the practice of the most
 judicious and liberal minded farmers of Strong
 land, I shall conclude my observations on
 Summer fallowing, by saying, that Light land
 is fallowed and cleaned by the Turnip system,
 or by frequent ploughings and harrowings,
 at almost any time; and that Strong land
 cannot be cleaned effectually, by hoeings on
 the surface, or by weeding of any descrip-
 tion; and that it is absolutely necessary,
 even with alternate seed and green crops,
 and manure, to Summer fallow it occasion-
 ally, in order to keep it in heart, and to have
 it in the most perfect state for Wheat.

2dly. By Bastard Fallows after Tares,
 Pease, and Beans.

* Home's Gentleman Farmer.

Tares, Pease, and Beans, make the soil lighter for a time by the separation of its parts, and thereby render it very advantageous to the succeeding crop. As the Tares are cut or fed, the ground should be ploughed; and according to the time that the fields are cleared, and the state of the land, more or less ploughings and harrowings must be given. It would be better to give but one ploughing after Summer Tares, as the roots of the tares ploughed under furrow would assist as manure for the following crop.

The land is apt to get foul with the Pease crop, and particularly with the broadcast husbandry, where the hoe cannot be so effectually used to destroy the vegetation of weeds; therefore, after the Pease are off the ground, it should be immediately ploughed; and, in order to prepare it properly for Wheat, it should have two ploughings more.

On Strong land, Wheat seldom comes in

regular course after Beans, excepting where it has been established from local circumstances, as before mentioned, or from cross-cropping. But great attention and labour are requisite after Beans, where Wheat is to follow. This crop being harvested later, the time of the year seldom admits of sufficient ploughings, on Strong land, preparatory to the season: For if it has not three ploughings, the ground will be foul; and being subject to the slug, the crop will be precarious. Light land is not favourable to Beans, and they should not be sown on that kind of soil.

The farmer must be particularly careful, on Strong land, to have his fields landed before or about the 20th of August, when the season begins to change; for if he be caught with them flat when the rain commences, he may lose great part of the advantage for which he has been toiling with his ploughs and harrows during the summer; and, in all probability, may not be able to land them in time for his Wheat season.

3dly. Wheat after Turnips.

This is the best preparation for Wheat on Light lands, provided the Turnips be fed off in time, so that the Wheat may be sown in the month of October, or early in November; for it has not only the advantage of the fallow and manure for the Turnips, but also the folding of the sheep. It is not very common to meet with this preparation for Wheat; but farmers should provide stock to feed off their Turnips in the autumn, as the advantage that would result to them from this mode of cropping is superior to any other.* This preparation for Wheat cannot be used on Strong land, for the reasons before assigned, under the head of Summer fallowing.

4thly. Clover Leys.

To feed turnips off the ground, then sow it with Barley and Seeds; and after feeding

* His Royal Highness the Duke of Clarence, at Bushy, has produced the most abundant crops of wheat from this preparation.

or mowing the seeds one year, to sow it with Wheat, is good husbandry on light land. On Strong land, it were better to Summer fallow, to lay up the land well water furrowed during the winter, and the ensuing spring, on one ploughing, to sow Oats and Seeds. The Wheat, from these preparations, will be clean and free from weeds, though occasionally subject to the slug in wet seasons.

If we suppose that farmers are well acquainted with the process necessary in all these cases, we shall find ourselves to be exceedingly mistaken; for their management, upon the same kind of soil, is wonderfully different. The Norfolk farmer, on Light land, when he ploughs his ley for Wheat, turns the sward flat over, and afterwards rolls it before he drills or dibbles it:*

* His Royal Highness the Duke of Clarence has introduced a Norfolk plough into Bushy Park, which, with one man from Norfolk, and four horses, ploughs, in two journeys, two acres a day; and when pressed, two acres and a quarter a day. Yet the farmers of Light land in

in many parts of Surrey and Middlesex, the occupier of Light land, turns the sward edgewise, and ploughs it in seams. Mr. Duckett, of whose ability and ingenuity there cannot be too much commendation, has a Skim coulter fastened to his plough, and ploughs a double furrow, turning the sward into the ground, and ploughing the crum above it; whereby he obtains a sufficient depth of mould for drilling. This is certainly the best mode of ploughing leys, on Light land, for the Drill husbandry. On Stiff land, the roots of the clover being so strong and deep in the ground, the ley cannot be well ploughed with the skim coulter; but must be ploughed with the swing plough, in seams for the Broadcast husbandry.

the neighbourhood pay no attention to this positive improvement, but drag their large swing ploughs, often with four, but never less than three horses, and seldom get over more than one acre a day. And the Norfolk ploughman was so much abused for innovation, that it was with the utmost difficulty his Royal Highness could persuade him to remain one year longer in his service.

MANURE.

It is essential to an abundant crop, in the preparation for wheat, that the land should be manured; for if it be not in good heart, it may produce clean corn, but it will be in small quantities.

“ Manure is found to give a new consist-
 “ ence to the soil with which it comes in
 “ contact; to render clay more friable, and
 “ to give tenacity to light and sandy soils,
 “ as well as to maintain in both a proper
 “ degree of temperature and humidity.”*

Manures are of various descriptions, and their application is a matter of great nicety. For Light land there is no manure so good as marle, and its use not only to restore but to alter the nature of the soil, has been well understood in many parts of the kingdom, even from the time of the Romans. “ The people
 “ of Gaul and Britain, have found out another

* Embassy to China.—Sir G. Staunton.

“ kind of manure for their grounds; which is
 “ a fat clay or earth, called marle, of which
 “ they entertain a very high opinion. Of
 “ those marles which are esteemed the fattest,
 “ the white ones are most valuable. Of these
 “ there are several kinds. First, that which
 “ hath the most sharp and piquant taste.
 “ Another kind is the white chalk marle,
 “ much used by silversmiths. For this they
 “ are sometimes obliged to sink shafts one
 “ hundred feet deep, where they find the
 “ vein spreading broader, as in other mines
 “ of metal. It is this kind of marle which is
 “ most used in Britain. Its effects are found
 “ to continue eighty years; and no man was
 “ ever yet known to have manured the same
 “ field with this marle twice in his lifetime.”*

The practical farmer cannot divide, arrange, and proportion the dung made upon the premises, without incurring an expence that would not answer his purpose. He

* Plin. Nat. Hist. lib. xvii. cap. vi. and viii. Henry's History of Great Britain, Vol. I. p. 312.

cannot part his stock in such a manner as to separate the manure conformably to its quality. Horse, cow, pig dung, &c. &c. are mixed together indiscriminately in the farm-yard, and used as circumstances may require. It is equally difficult to ascertain the proper quantity of manure requisite for fertilization. The quality of the soil, and of the dung, are points that should be previously established, in order to fix a just proportion conformably to the richness of the manure, the nature of the ground, and the heat in which it may be found. A certain number of loads per acre is usually carried upon the land for the ensuing season, which depends upon the judgment of the farmer, and the crop for which it is intended. And it seems impracticable to fix any other general rule to guide his conduct. If chalk lime, or other manure, is to be brought to the farm, for distinct purposes, the farmer has it then in his power to procure that which will best suit his land, and the crop he proposes.

It is a bad practice to tread straw and other fodder into manure; the best way of converting it into dung, is to pass it through the body of an animal. "Dung of animals that chew the cud, being more thoroughly putrified than that of others, is fit to be mixed with the soil without needing to be collected into dunghills." This circumstance shews the utility of folding sheep on arable land for manuring the soil.

On Summer fallows, it were better to manure the land preparatory to Wheat: for, being then in the highest state of pulverization, the earth mixes more intimately with the dung. But when Wheat is to follow Turnips, Beans, Pease, or Tares, it were better to manure for the green crop; as in that case, the ground being in good heart, and the manure incorporated with it, the Wheat will be more equal.

Dung should not be carted upon the pile,

but thrown up lightly with the longest straw or litter in the middle, that speedy fermentation may destroy seeds of noxious weeds; and the less dung is turned and moved, the more advantageous it will prove to the crop. Tull remarks, that "the longer
 "dung ferments without the ground, the
 "lesser time it has to ferment in it, and the
 "weaker its ferment will be;" for at every moving or turning, fresh fermentation ensues; and the manure thereby loses much of its invigorating qualities.

Dung should be spread and ploughed into the ground without delay; for by lying on the field in heaps, some of the moisture will soak from it, and produce tufts of corn stronger than in the other parts of the field.

A variety of top-dressings are used on Light soils; but the land should be in sufficient heart for the Wheat crop without their assistance. When land is not in good condition, they are advantageous to spring corn.

On Light land, to Fold Sheep on Wheat immediately after sowing, will prove an excellent top-dressing, and give vigour to the growth.

Top-dressings on Strong land are of little use; their effect is scarcely perceptible at harvest; for the ground, in general, is not sufficiently absorbent for them, and they are washed by lying on the surface. Rabbits' dung sown on Strong land with Wheat, and ploughed under furrow, proves very advantageous to the crop; but more than from fifty to sixty bushels per acre would produce too much bulk of straw.

If manure be carried upon the fallow long before the Wheat is sown, it will get too early into fermentation, and the crop will not only lose a great part of the advantage to be derived from it, but the Wheat will be, what the farmers call, Winter Proud.

SEED.

It is the practice of all good farmers, in cropping their ground, to use seed from a different soil.

“ Every species of animals has a climate adapted to it, where it flourishes, where it grows to perfection, and where it never degenerates. But as Wheat is not a native of Britain, it has a tendency to degenerate here; and it degenerates rapidly, if the seed be sown year after year where it was produced. It is not sufficient that the seed be taken from a different field, it should be taken from a different soil.”*

Seed improves by culture, as it degenerates by omission of it.

Seed varies according to the degree of

* Home's Gentleman Farmer.

heat and cold, moisture or dryness, on Strong or on Light lands.

Seed brought from poor land in the best tilth, and sown in a rich soil, will make a good change, will flourish and improve.

Seed from rich land sown on a poorer soil, will flourish more than seed from the same kind of soil, as it will have a better stamina to support it than that which grew in the poorer soil.

Care should be taken not to sow seed amongst which there have been smutty grains.

I was told by a farmer in Hampshire that he never changed his seed, and it was incredible the quantity of smut there was in the corn. He insisted upon its being the nature of the land; and expected smut regularly in his wheat, without making an effort to

check it; and could not be prevailed upon to try a change of seed.

Whenever there are smutty ears in a crop, it is to be suspected that many others are infected. In 1798, particularly, the season being remarkably wet, there was more smut than usual in the wheat. Tull says, that "Smutty wheat is a token of *mala stamina*:" and I believe he is perfectly right; for in 1798, although I sowed the same sort of seed in all my fields, I found the most smut upon the land in the worst heart.

I have known farmers draw the bad ears of wheat from the sheaves, and, rejecting them, thresh only those that were good, for seed. This is rather expensive; but the advantage of obtaining prime seed, more than compensates for the extra expence, as there cannot be too much attention paid to the quality of the seed.

White Wheats are apt to grow more

luxuriantly on Light, and Brown on Strong land. I have found White Wheats, when sown repeatedly on Strong land, become gradually browner.

STEEPS FOR WHEAT.

Steeps are used to render the seed more fruitful, as preservatives against distempers in corn, and to prevent the worm from eating it.

Tull relates, " In the last century, a ship
 " load of Wheat was sunk near Bristol, in
 " autumn, and afterwards at ebbs, all taken
 " up after it had been soaked in sea water ;
 " but being unfit for the miller, the whole
 " cargo was bought up by farmers, and
 " sown in different places. At the following
 " harvest, all the wheat in England hap-
 " pened to be smutty, except the produce of
 " this brined seed, and that was all clear
 " from smuttiness. This accident has justi-
 " fied the practice of brining ever since, in
 " most parts of England."

I have brined Wheat with salt and water, and then sifted lime upon it, to dry it before it was sown.

I have used lime slacked with boiling water, then pouring it upon the seed, mixed it together before it was sown.

I have sown Wheat brined and dry in the same field, but have not been able to mark the difference at harvest.

I have sowed the same sort of seed brined and limed in different fields, and have found one field in a thriving state, whilst another has been almost entirely destroyed by the slug.

But in what manner can lime or brine affect the seed, to make it more fruitful? If the seed be perfect in itself, and the ground in good heart, the brine or lime can have no influence upon its vegetative quality; I should

think it might rather have a contrary tendency.

If the seed be diseased, brine or lime cannot cure it, or make it perfect.

Smutty grains are filled with a black powder. As these grains are very easily broke, they spread the powder on the sound grains, and this powder sticks on their extremity. Steeps may wash this powder away. Smutty corn is so thoroughly destroyed that it cannot germinate. The seed which in itself is perfect, and has only the powder spread over it, grows very well; though I would not recommend such seed to be sown.

The worm does not usually destroy the seed till it is in a state of vegetation; and it is neither the brine nor lime that will prevent the seed from being perished by the weather.

“ To satisfy myself,” says M. Duhamel,

“ whether or no any benefit does arise from
 “ the use of Steeps, by way of giving the
 “ seed a greater degree of fruitfulness, I
 “ tried the following experiment.

“ I infused some good wheat in a lye of
 “ dung, mixed with lixivial salts, nitre, and
 “ sal ammoniac. I sowed with this grain
 “ two beds in my kitchen garden, dug with
 “ a spade. One of the beds was sown very
 “ thick, and the other very thin. At the
 “ same time I sowed two other beds, exactly
 “ like the former, with some of the same
 “ seed, not steeped, one thick, and the other
 “ thin. At harvest time, the beds sowed
 “ with the steeped seed were so exactly like
 “ the others, that it was impossible for the
 “ eye to distinguish between them.”

The seedsman, in the Broadcast hus-
 bandry, says he sows the seed better after it
 is limed, because it is not so apt to slip
 through his hand, as when sown dry. But
 this is only owing to the habit of the

seedsman sowing Wheat brined or limed. He sows Oats, Barley, Clover, &c. without being brined or limed.

After repeated trials in different ways, I never could perceive any particular advantage result to the crop from steeping. I apprehend that their use is a custom founded on prejudice, or introduced by some such accidental circumstance as Tull relates, which it will be very difficult to abolish, and probably not wise to attempt.

TIME OF SOWING.

Wheat should be a reasonable time in the ground, in order that the seminal root should have established its growth, before the coronal root begins to shoot. It is not perhaps necessary for this purpose, that wheat should remain in the earth so long as eleven months. But towards the end of September, in this climate, frosts begin to check vegetation, and if the seed should be caught by severe weather in the act of throwing out

the germ and seminal root, the weaker grains would be subject to perish. Therefore all Wheat sown after the month of October, or early in November, becomes a hazardous crop, particularly on Cold Strong land.

Wheat should be sown when the land is moist, otherwise it may be spoiled by lying long in the ground before rain comes.

In the Downs of Hampshire, Wiltshire, and Dorsetshire, farmers begin to sow Wheat after rain in August. For if the corn is not forward enough to cover the ground before winter, it seldom thrives, on those lands, especially if the ensuing spring prove dry. But if Wheat, on Strong land, be sown too early, Black Bents and Butterweed will make their growth with the corn, and though, during the winter, the plant will look flourishingly, yet in the spring, it will turn yellow and sickly, and with difficulty will recover itself.

Spring Wheat, as it is called, seldom answers; because the seminal and coronal roots are both making progress at the same time, which must necessarily diminish the vigour of the plant; and the grain, of course, becomes less mature than if the roots had grown in regular succession. The Canadian Wheat, therefore, is not so good as that which grows in Europe.

Mr. Home, in his Gentleman Farmer, says, "Spring Wheat will not answer on strong clay, as it has not sufficient time to ripen." Dr. Hunter observes, "In the northern countries, Wheat is generally sown late; when the frosts come the seminal roots that are near the surface are frequently chilled, so that they can but imperfectly supply the plant with nourishment during the winter."*

* It astonished me, that this very ingenious gentleman, some time after the publication to which I have alluded, should have written, in the Annals of Agriculture,

There are various modes of sowing and planting Wheat.

1st. The Broadcast husbandry.

The seed being harrowed into the ground.

This method is very imperfect, as the seed is unequally scattered; in some places too thick, others too thin; some so deep, that the pipe of communication is too long between the seminal and coronal roots; others so shallow, that the seeds are subject to perish from being exposed to wet, and the inclemency of the weather. A good seedsman, from great practice and attention, will sow with a certain degree of precision; but although this method is far from perfection, yet the farmer, on Strong land, is

on transplanting of Wheat. For the seminal root, which had established its fibres in the earth, and had given strength to the set, must, of course, be weakened by the operation of transplanting: and it must be a considerable time before it has recovered itself, in such a manner as to enable the crown with vigour to throw out its coronal root; consequently, there must be a greater objection to transplanting than to Spring Wheat.

obliged to have recourse to it, as neither drilling or dibbling will succeed on that kind of soil.

On the last ploughing of a fallow on a Strong soil, those lands appear to be the best, which will permit the water to soak freely from them without laying the ridges too high. Six bout lands of a plough that takes a furrow of nine inches, seem to be well calculated for that purpose. Smaller lands multiply crum furrows, and much corn is thereby lost; for all those ears, which grow near to where the water drains, are feeble, and seldom come to maturity. But there can be no general rule from which a deviation may not sometimes be required. On very wet ground, for instance, three or four bout lands may be necessary. And four bout lands are essential to the farmer on a small farm, because six horses, in that case, are sufficient to work it; four horses may be used at plough, whilst two with two harrows are employed at harrow.

The ploughman, on ploughing his land for the season, should lay his furrows neatly against each other, forming so many seams for the seed to fall into. And he should make seven or eight bouts of the usual six bout lands, in order that the seed may be more equally divided on the land. Harrows should be made to cover the land exactly; they should be sufficiently weighty not to fly about; and the tynes should follow each other in such a direction, that on crossing them, the whole of the land should be harrowed. I have some Essex harrows, which appear to me to be the best suited for this purpose, on Strong land. On cold stiff soils, if it were possible to sow wheat in beds, as practised in Ireland for potatoes, the produce would be infinitely greater. The trenches need not be so wide, as there is no occasion for crum to cover the wheat.

2dly. The Broadcast husbandry.

The seed being ploughed under furrow.

This is a better method than the last, on Strong land; but still it has the imperfection of the seedsman, and the difficulty of sowing a great wheat season in proper time.

When the seed is to be sown on the fallow whilst flat, the seedsman proceeds, by first sowing the seed broadcast, and then the field is landed in the usual manner. But if the field has been rough landed from the fallow, (provided the season be not too wet) it should be harrowed crossways equal to a days work of as many teams as are to be employed in it: although it would be better, on the rough landing, not to crum the furrows, which would render the precaution of harrowing unnecessary; for the less Strong land is trod, the lighter it will be, and the better for the crop. The seedsman then sows one land only for each team; and as soon as that land is ploughed, the team must stop till the seedsman sows the next, and so on.

The greatest nicety must be observed by the ploughman to plough the veerings very small and thin, that the seed may not be too thick on the crown of the land. He should also make seven or eight bouts of his six bout lands, in order that the corn may be more equally distributed throughout the field.

gdly. The Drill husbandry.

The drill husbandry, for Wheat, cannot be carried into practice on Strong land. The great objects on that kind of soil, is to plough the ridges up, in such a manner, that the ground may lie loose, and that wet may not lodge upon them. But the drill plough, by drawing drills, hardens the soil; and the horses, by treading upon Strong land, make so many basons to contain water during the winter, that the corn would be subject to perish. For nothing is so prejudicial to Wheat as wet; and, in the spring, the land would become so stiff and water bound, that no hoe or harrow could sufficiently ease it. I tried

this experiment last year on two acres of Strong land, and lost half my crop of Wheat by it.

On Light land, the drill husbandry may be used to the greatest advantage, either upon Mr. Duckett's plan (the seed boxes following the drill plough), or with Cook's drill machine.

In Norfolk, I observed a clumsy mode of drilling wheat. The land being ploughed from a ley, a heavy notched iron roller was drawn by six horses over the field, and pressing the flag or sward, made a certain number of seams for the corn to drop into, which was sown broadcast, and then bush harrowed to heal the seed. This method is certainly clumsy, and no person who had been once conversant with either Cook's or Duckett's system, would ever use this roller again.

His Royal Highness the Duke of Clarence has introduced Mr. Duckett's plan of drilling

at Bushy with great success; but improvement might still be made on Ducket's seed boxes.

The land, if lying dry, being prepared quite flat for the crop, the harrows precede the drill plough, which draws five drills at nine inches apart: Mr. Ducket hunts back three, and makes good two drills; the seed boxes then follow in each drill, and light harrows heal the seed.

The advantage of placing the seed at a given depth, and of hoeing the intervals in the spring, are points of great consequence to the crop; but by the seed being indiscriminately dropped in the drills, without ascertaining, with nicety, the place for each grain, the corn grows in clusters, and the coronal root and pipe of communication of one set is intermixed with that of the other.

“ And it is very important not to load the
“ earth with more plants than it can nourish,

“for the crop would be considerably diminished thereby.”

If Wheat be sown too deep in the ground, the crop may be lost; if too shallow, it may be injured by the weather. It should not be less than two inches deep, nor more than three. This depth will give an ample allowance for the surface of the land to settle after sowing. “If Wheat be planted too deep, there is great danger of its being eaten off by the worm, between the grain and the blade.”*

4thly. Dibbling Wheat.

This mode of setting Wheat was introduced by a farmer near Norwich, and is now become very general in many parts of Norfolk. It appears to be the most perfect system, in particular cases, provided there was but one grain dropped into each hole.

* Tull.

The Dibbling iron, now in use, being an inverted cone, with its axis about four inches in length, seems to have been originally invented with a view of forming a hole to receive one grain only. But the farmer allows three grains to be dropped into each hole, and from carelessness or inattention of the children who are employed in this work, four or five are frequently dropped, which is erroneous; as the coronal roots of those grains, in the spring, must interfere with one another and produce clusters.

The Dibbling irons, and method of using them, might be amended by making them lighter, and uniting to one handle a certain number of cones; by which means, the holes would be made much quicker, and with more accuracy than by the present practice. I have heard, that in some parts of Suffolk such a machine is now in use.

Dibbling Wheat on Strong land will not answer. The pressure made by the hand,

in the act of dibbling, would harden the ground at the bottom, and render it a receptacle for water; and the hole made by the dibbling iron would not be sufficiently closed by the harrow, to prevent the wet from getting into it during the winter. The ground would also be so much poached by treading on it, as to render it very unfavourable to the crop.

Upon fallows, on Light lands, it will have the inconvenience of the hole filling up so fast, after the pressure is made by the iron, as to prevent the seed from being dropped regularly into it.* The drill husbandry in this case is preferable; but on Clover leys on Light land, it were to be wished that dibbling could be introduced into general practice.

Monsieur de Chateau Vieux's experiments

* Summer fallows for Wheat on Light land, is bad husbandry. I mean here, Light land prepared for Wheat after Turnips.

on Wheat are curious; but he seems not to have perfectly understood the structure of the plant, which Dr. Hunter has so ingeniously traced out for us. As a proof of the superior advantage of the Dibbling system, I shall recite one of his experiments, to shew the prodigious produce of Wheat from the grains being planted singly.

On the 16th of September, 1755, he sowed three rows of Wheat, of 93 clusters in each row, and 10 or 15 grains in each cluster.* In order to place them with some kind of regularity, he made use of an iron hoop about three inches in diameter. This was laid upon the ground at each place that was to be sown, and the grains were dropped at nearly equal distances, some round the inside, and some round the middle of this circle. Each cluster was sown in this manner; the space from one centre to another

* I wish he had been more correct about the number of grains.

was about five inches; and the quantity of seed employed in this operation, was five ounces and twelve penny weights.

It was reaped on the 31st of July, and the produce weighed 23 pounds of grains, or about sixty-seven for one.* By his former experiments, he found that if five or six grains of Wheat were dropped together in one hole, they clustered too much, and did not thrive conformably to his expectations. This circumstance having induced him to try this experiment, he found, (although, as he says, the year was rather unfavourable) that planting single grains, and giving them room to grow independent of each other, was the most advantageous for the crop.

Taking Monsieur de Château Vieux's experiment at the medium between 10 and

* In the Plains of Ossuna, in Andalusia, I inquired the usual produce of Wheat, when I was told, that the best lands, in a good season, would produce from fifteen to twenty for one.

15 grains, we shall suppose he sowed $12\frac{1}{2}$ grains in each cluster, or 25 grains in two clusters, which would give a space for each grain of about three square inches. Thus, by this experiment, at the above medium, he sowed 3486 grains. I have weighed five ounces twelve penny weights of Wheat, and found they contained 3860 grains.

We usually sow Broadcast, on Strong land, about three bushels of Wheat per acre. Now, allowing 60lb. to the bushel, and supposing six bout lands, as before mentioned, and admitting that the seed could be regularly placed, we should find a space of about $8\frac{1}{2}$ inches for each grain, which approaches very nearly to the above recited experiment. And I am convinced, that in the Broadcast husbandry, on Cold Strong land, particularly where the ground is seldom hoed, or otherwise worked from seed time till harvest, a smaller quantity of seed should not be sown. And from the variety of causes that operate against the growth of

Wheat, it is very ill judged to be sparing of seed.

We cannot, however, obtain a produce equal to Monsieur de Chateau Vieux. For in this uncertain climate, where the seasons are so precarious, and the winter is generally so wet and cold as to prove destructive to the sets of Wheat; where the spring is frequently ungenial to the growth and bloom of it;* and where the harvest rarely terminates in August, but is often protracted till October; one load of Wheat per acre is deemed a most abundant crop, though the farmer frequently has not half the quantity. And I believe the whole produce of Wheat in England, on an average, does not exceed, and I much doubt if it even amounts to, three quarters per acre, or eight for one.

But in order to arrive at a greater degree

* Last spring, cold rain came on, followed by frosty nights, just as the Wheat was getting into full bloom; which was one principle cause of the blight that ensued, and the deficiency of the crop.

of perfection in the culture of Wheat, it is necessary, though with great caution, to relinquish prejudices by the introduction of those systems that are best adapted to the different soils; by a general and minute attention to every circumstance respecting the preparation for it, and during its growth; and by a watchfulness not to lose the seasons, as much corn is perished by late sowing.

“Rotation of crops in the same field, universally practised, is what probably has promoted the opinion of a specific nourishment. It has been urged, that if all plants live on the same food, the soil must be exhausted by a succession of different plants, as much as by a succession of the same plant. But the change of species is necessary, not for food, but for preventing degeneracy. Wheat degenerates where sown without intermission in the same field.”* And I am humbly of opinion, whether on Light or Strong lands, if the crops

* Home's Gentleman Farmer.

be mixed alternately with those that are meliorating, or with fallows; that, in a long course of husbandry, the ground would be kept in better heart, and both the public and the farmer would reap more advantage from having Wheat in succession every fifth year, than if it were to come oftener in rotation.

FEEDING SHEEP ON WHEAT.

This is a barbarous custom, introduced probably by some improvident farmer, who wanted food for his stock in the spring. But when Wheat is sown early in autumn, or when the winter is open and mild, it is apt to get too forward; and in that case, (although it is a very nice point to manage) Sheep may be turned in to feed it, in order to check its rankness, and give strength to the set. Great care however must be taken, on Strong land, that the ground be perfectly dry, or the Sheep will poach it; and every mark of their feet will become a cup for the reception of water, which, if the season prove wet, may damage the crop. On Light

land it is useful, in the spring, to run a flock of Sheep over Wheat; they give tenacity to the soil by treading it, which prevents the corn from root-falling.

Sheep may be put into Wheat sown on leys where the slug has been busy; they knip off the set close to the ground, and by treading of it, frequently destroy the worm.

I have kept Sheep on Strong land early in March, when the weather has been dry, till there has scarcely been the appearance of any crop on the ground; but such feeding of Sheep must be done with infinite caution, and before the coronal root makes progress; for if Wheat be fed backward, Sheep will not feed exactly as we could wish them, but will wantonly bite where they have bit before, and the crop may be endangered by it.

HOEING.

On the food of plants, let philosophers still indulge their imaginations; for few are

yet agreed upon the subject. The practical farmer must follow the dictates of experience, which facts have demonstrated to be effectual. He knows that the earth gives life and vigour to his crop; "but in what manner, or by what means such effects are produced, will for ever remain a secret; nor ought he to repine at his ignorance of such matters."

"The province of agriculture is to cultivate soils in such a manner, as to furnish juices in plenty; the rest must be left to nature, and may safely be left, for she never errs in her operations."*

Mr. Home pronounces Tull to be a bold theorist, but defective in principle. But it appears to me, that Tull's system has not been thoroughly understood; for there are many points in his practice, which are very favourable to fertilization; and particularly that of hoeing.

* Home's Gentleman Farmer.

All plants flourish in proportion as the land lies loose and light about them, to admit of moisture, and give room for the tender fibres of the roots to expand themselves, without meeting with obstinate resistance.

Land, after pulverization, tends to coalesce, and unite its divided particles. And as it is impracticable to destroy the growth of all kinds of weeds by the previous fallow or cleaning, whenever the hoe can be used, it should be introduced. On Light land, the Drill husbandry is very favourable to the use of the hoe, and it admits of either horse or hand-hoeing. The horse-hoe, in some respects, is more advantageous than the hand-hoe, as it moves more earth, and loosens it deeper than the other. Mr. Cook's or Duckett's horse-hoe may be used when the farmer is become expert in the Drill husbandry. At the same time that the horse-hoe is used, it may be necessary to follow it with the hand-hoe, to clear such weeds as may grow near or close to the drills, which the horse-hoe may not be able to remove.

The hoeing should be used in the spring, about the time that the vegetation of weeds has taken place, and the coronal root begins to shoot. Women and children may be taught to hand-hoe, which will encourage industry, and give employment to the lower sort of people.

If the ground be not clean, it may require more than one hoeing; but land, not previously cleaned, is unfit for Wheat. And, if Wheat has followed Turnips fed off, I would recommend Clover to be sown between the drills after the first hoeing; in that case, it can have but one hoeing.

On Strong land, when Wheat has been sown broadcast, and particularly if the season has been too fine, the ground frequently becomes so hard by the rain in the winter, and the drying winds in the spring, that it will admit of no means of loosening it. Harrows will sometimes ease it, but not sufficiently to produce the same advantage as the hoe, if it were practicable to use it. But

the Broadcast husbandry is unfavourable to the hoe, as the space between the sets is irregular, and seldom admit of its being applied.

HARVESTING.

It is the custom in many parts of the country, not to begin reaping till the ears of corn are full ripe, and bend their heads towards the ground. The consequence of which is, that the Wheat will be shaken, and part of it must shed before the reaper can get through the work. This is certainly a very erroneous practice, and the more judicious farmers begin to cut their Wheat when the roots appear to be dry, but whilst the straw is yet green. It will then ripen in the straw, and bear a great deal of wet without damage, as it will not imbibe the water like full ripe corn. On Strong lands, where Wheat has been sown on a fallow, it should be hand-reaped; otherwise many little lumps of earth will be cut with it, and when threshed,

will spoil the sample. On Light lands, and Clover leys, the Wheat should be fagged (as it is practiced in the vicinity of London) at which the harvesters are very expert. By this means the farmer obtains more straw, and his land is at once cleared from the stubble, without additional expence.

Mowing Wheat with a scythe, made for the purpose, with binders to follow the mowers, would expedite the harvest, and prove very advantageous, provided it could be brought into general use; but as it is a work that requires much dexterity, it can be only introduced by degrees. I have heard, that this method has been partially tried in some parts of Essex; but such violent opposition was made to it, that farmers have been deterred from the practice.

When Wheat is cut before it becomes quite ripe, it requires to have good field room, and not to be housed or ricked too early, or it may become mow-burnt; unless Lord

Robert Seymour's judicious plan of funnels were introduced, to give ventilation to the ricks.* Some additional expense would also attend the threshing of the corn when cut before it is quite ripe, with constant complaints of the threshers; but these disadvantages are by no means adequate to the loss which would be sustained when Wheat is cut too ripe.

CONCLUSION.

Having thus endeavoured to point out the various methods in use, and the best mode of practice, for the culture of Wheat on different soils; I must beg leave to add, that the most liberal premiums should be offered for the construction of every implement of husbandry, in order that a just standard may be fixed for them, founded on mathematical principles; for most of those articles are now made by no other rule than the usual habit of the wheel or ploughwright. And that the expense of them might come within the

* Vide Annals of Agriculture, No. 150, of the year 1796.

compass of the common farmer, Government should be induced to purchase the models, after satisfactory proofs of their precision and utility. On this point, the progress of improvement principally depends. We cannot change the nature of land; it must ever remain the same; and it can only be rendered highly productive, by the superior skill and abilities of those who cultivate it, aided by the most perfect implements, to be used conformably to the soil.

Rewards should be offered for Norfolk ploughmen to establish themselves with farmers on Light land, for they surpass all others in activity; and Mr. Duckett's Skim Coulter, and Drill system, where dibbling cannot be used, should be recommended for Light soils throughout the kingdom.

The munificent encouragement given by His Majesty to experiments at Windsor; the exertions of many Noblemen and Gentlemen; and the Societies for promoting Agricultural Knowledge; are great examples, worthy of

imitation. But as the same public spirit does not generally prevail, I would recommend it to the Board of Agriculture, as a preliminary step towards a similar institution in every county of the kingdom, to establish two farms, within a few miles of the metropolis; one of very Strong land, not less than 200 acres; the other of Light land, not less than 400 acres; for I must repeat, that it is absolutely necessary to keep the systems distinct. Then, without attempting to deviate from that sort of tillage which is agreeable to their respective soils, a regular course of cropping for each separate farm should be introduced and pursued; and farmers, accustomed to Strong or Light land, should be employed to manage them, under the superintendence of some person appointed by the Board for that purpose. These should be the National Farms of Experiment; where every new instrument to be used in Agriculture should be tried; where the farm houses, yards, barns, stables, &c. should be formed upon the most approved plans, and constructed at the smallest

possible expense; and where every effort should be made, to ripen knowledge in all the different branches of husbandry. Reports of progress, together with the description and approbation of every implement used on these farms, should be published at a small price, and circulated monthly.

In this age of increasing population, wealth, and luxury, it is incumbent upon the legislature to exert its utmost influence in support of Agricultural improvement; and if a system of this kind were once set on foot, with the assistance of Government, and regularly conducted, it would soon compensate to the public for the additional expense necessary at the outset; and the ultimate advantages to the kingdom would be incalculable.

